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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/582,351	08/11/2000	TOSHIYUKI NAKAYAMA	106386	3351

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EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 03/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/582,351

Applicant(s)

NAKAYAMA, TOSHIYUKI

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 10, 12 - 19, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 10, 12 - 19, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on January 3, 2003 has been received and entered in the case.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3 ~ 10, 12, 14 ~ 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeta et al. in view of Moore.

Regarding claim 1, the method steps are disclosed by Maeta et al. and Moore for the same reasons provided below paragraph, the device claim 12.

Regarding claim 12, Maeta et al. discloses in Fig. 2 a semiconductor device comprising:

- a semiconductor chip (2) having a plurality of electrodes (2a);
 - a substrate (1) on which is formed a plurality of leads (1a, directly attached to the 1b);
- and

- an adhesive (5) provided between a surface of the semiconductor chip (2) on which the electrodes are formed and a surface of the substrate (1) on which said leads are formed, and adhering the semiconductor chip and the substrate,
- wherein at least one of the plurality of electrodes (2a) and at least one of the plurality of leads (1a, directly attached to the 1b) are electrically connected; and
- wherein on the substrate (1) in a region including at least a part of a region opposing the semiconductor chip, a film (1a in middle) is formed with a lower adhesion to the adhesive (5) than a base material of the substrate. Further, since Maeta et al. does not limit wiring patterns to any specific or particular device, his/her disclosure encompasses all well known wiring patterns' including "leads."

Maeta et al. does not disclose the film being broader than each of the leads at their portions opposed to the electrodes. However, Moore discloses in Fig. 4 a film (36) being broader than each of the leads (40) at their portions opposed to electrodes. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Maeta et al. by using the shape of the film as taught by Moore. The ordinary artisan would have been motivated to modify Maeta et al. in the manner described above for at least the purpose of increasing heat dissipation (column 4, lines 54 and 59).

Regarding claim 3, since Maeta et al. shows said leads and said film being formed from same material, the process "said leads and said film are formed by etching a conductive foil adhered to said base material of said substrate" is inherently disclosed by Maeta et al. and Moore.

Regarding claim 4, Maeta et al. discloses a conductive foil used when forming said leads is also used to form said film (see Fig. 2).

Regarding claim 5, Maeta et al. discloses said film being formed simultaneously with said leads.

Regarding claims 6 and 15, Maeta et al. discloses in Fig. 2 the electrodes (2a) being provided at an extremity of the surface of the semiconductor chip (2); and the film (1a in middle) is formed in a region opposing a central part of the surface of the semiconductor chip (see Fig. 2).

Regarding claims 7 and 16, Maeta et al. discloses in Fig. 2 the film (1a in middle) being formed to spread two-dimensionally, with at least one opening exposing a surface of the substrate.

Regarding claims 8 and 17, Maeta et al. discloses in Fig. 2 the film (1a in middle) being formed to project outside a region in which the semiconductor chip is adhered.

Regarding claims 9 and 18, Maeta et al. discloses in Fig. 2 the film (1a in middle) being formed to be symmetrical about a center point of a region in which the semiconductor chip is adhered.

Regarding claims 10 and 19, Maeta et al. discloses in Fig. 2 the film (1a in middle) being formed to avoid at least one of the leads (see Fig. 2).

Regarding claim 14, Maeta et al. discloses said leads and said film being formed of the same electrically conductive material (see Fig. 2).

Regarding claims 21 and 22, these claims merely recite the intended use or the environment in which the semiconductor device of claim 12 is intended to be used. Since the claims fail to define any additional structure, Maeta et al. anticipates these claims as well.

4. Claims 1 ~ 10, 12 ~ 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukagoshi et al. in view of Moore.

Regarding claim 1, the method steps are disclosed by Tsukagoshi et al. and Moore for the same reasons provided below paragraph, the device claim 12.

Regarding claim 12, Tsukagoshi et al. discloses in Fig. 1 a semiconductor device comprising:

- a semiconductor chip (1) having a plurality of electrodes (2);
- a substrate (4) on which is formed a plurality of leads (5); and
- an adhesive (11) provided between a surface of the semiconductor chip (1) on which the electrodes are formed and a surface of the substrate (4) on which said leads are formed, and adhering the semiconductor chip and the substrate (see Fig. 1),
- wherein at least one of the plurality of electrodes (2) and at least one of the plurality of leads (5) are electrically connected (see Fig. 1); and
- wherein on the substrate (4) in a region including at least a part of a region opposing the semiconductor chip, a film (6) is formed with a lower adhesion to the adhesive (11) than a base material of the substrate (see Fig. 1). Further, since Tsukagoshi et al. does not limit electrically conductive circuits to any specific or particular device,

his/her disclosure encompasses all well known electrically conductive circuits including "leads."

Tsukagoshi et al. does not disclose the film being broader than each of the leads at their portions opposed to the electrodes. However, Moore discloses in Fig. 4 a film (36) being broader than each of the leads (40) at their portions opposed to electrodes. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Tsukagoshi et al. by using the shape of the film as taught by Moore. The ordinary artisan would have been motivated to modify Tsukagoshi et al. in the manner described above for at least the purpose of increasing heat dissipation (column 4, lines 54 and 59).

Regarding claims 2 and 13, Tsukagoshi et al. discloses the adhesive is formed of an anisotropic conductive material having conductive particles dispersed in an insulating material (column 6, lines 49 ~ 55).

Regarding claim 3, since Tsukagoshi et al. discloses said leads and said film are formed from same material (read column 6, lines 24 ~ 33), the process "said leads and said film are formed by etching a conductive foil adhered to said base material of said substrate" is inherently disclosed by Tsukagoshi et al.

Regarding claim 4, Tsukagoshi et al. discloses a conductive foil used when forming said leads is also used to form said film (see Fig. 1).

Regarding claim 5, Tsukagoshi et al. discloses said film is formed simultaneously with said leads.

Regarding claims 6 and 15, Fig. 1 of Tsukagoshi et al., where the reference shows the electrodes (2) are provided at an extremity of the surface of the semiconductor chip (1); and the

film (6) is formed in a region opposing a central part of the surface of the semiconductor chip (see Fig. 1).

Regarding claims 7 and 16, Fig. 1 of Tsukagoshi et al., where the reference shows the film (6) is formed to spread two-dimensionally, with at least one opening exposing a surface of the substrate.

Regarding claims 8 and 17, Fig. 1 of Tsukagoshi et al., where the reference shows the film (6) is formed to project outside a region in which the semiconductor chip is adhered.

Regarding claims 9 and 18, Fig. 1 of Tsukagoshi et al., where the reference shows the film (6) is formed to be symmetrical about a center point of a region in which the semiconductor chip is adhered.

Regarding claims 10 and 19, Fig. 1 of Tsukagoshi et al., where the reference shows the film (6) is formed to avoid at least one of the leads (see Fig. 1).

Regarding claim 14, Tsukagoshi et al. discloses said leads and said film are formed of the same electrically conductive material (see Fig. 1).

Regarding claims 21 and 22, these claims merely recite the intended use or the environment in which the semiconductor device of claim 12 is intended to be used. Since the claims fail to define any additional structure, Tsukagoshi et al. anticipates these claims as well.

5. Claims 2 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeta et al. and Moore as applied to claims 1 and 12 above, and further in view of Oda (JP-07169795).

Maeta et al. and Moore disclose the claimed invention except for the adhesive being formed of an anisotropic conductive material having conductive particles dispersed in an insulating material. However, Oda teaches the adhesive (108 in Fig. 1) being formed of an

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anisotropic conductive material having conductive particles dispersed in an insulating material (see Fig. 1 and read constitution). Maeta et al., Moore and Oda are analogous art because they are from the same field of endeavor that is the semiconductor device. At the time of the invention, it would have been obvious to one of ordinary skill in the art to further modify Maeta et al. by including the adhesive to be formed of an anisotropic conductive material which is having conductive particles dispersed in an insulating material as taught by Oda. The ordinary artisan would have been motivated to further modify Maeta et al. in the manner described above for at least the purpose of increasing electric connection. Therefore, it would have been obvious to combine Maeta et al. and Moore with Oda to obtain the invention as specified in claims 2 and 13.

Response to Arguments

6. Applicant's arguments filed on January 3, 2003 have been fully considered but they are not persuasive.

On page 2, applicant argues "Neither Maeta nor Moore disclose a film that is formed with a lower adhesion to an adhesive than a base material of a substrate as recited in independent claims 1 and 12." This argument is not persuasive. Maeta discloses in column 1, line 28 and line 39 a film (1a) being a wiring circuit and a base material of a substrate (1) being an alumina. Alumina is an inorganic material and the wiring circuit is metal which by nature has lower adhesion to an adhesive than alumina. Note applicants own specification, page 10, lines 1 ~ 3

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and page 14, lines 13 ~ 15 where adhesion to an adhesive between inorganic material and metal is acknowledged.

Further, applicant's arguments against Moore have been fully considered but not deemed to be persuasive because only teaching the Examiner being relied on therefrom is the shape of the film.

Finally, applicant argues "Tsukagoshi does not disclose a film formed with a lower adhesion to an adhesive than a base material of a substrate as recited in independent claims 1 and 12." This argument is not persuasive. Tsukagoshi discloses in column 4, lines 43 ~ 46 and column 5, lines 5 ~ 11 a film (6) being dummy electrodes and a base material of a substrate (4) being an inorganic material. The dummy electrodes are metal which by nature have lower adhesion to an adhesive than the inorganic material. Note applicants own specification, page 10, lines 1 ~ 3 and page 14, lines 13 ~ 15 where adhesion to an adhesive between inorganic material and metal is acknowledged.

For the above reasons, the rejection is maintained.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

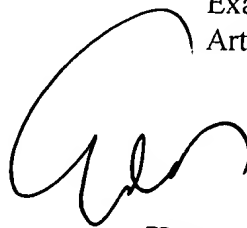
MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815



EDDIE LEE
SUPERVISORY PATENT EXAMINER
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c.c.
March 21, 2003